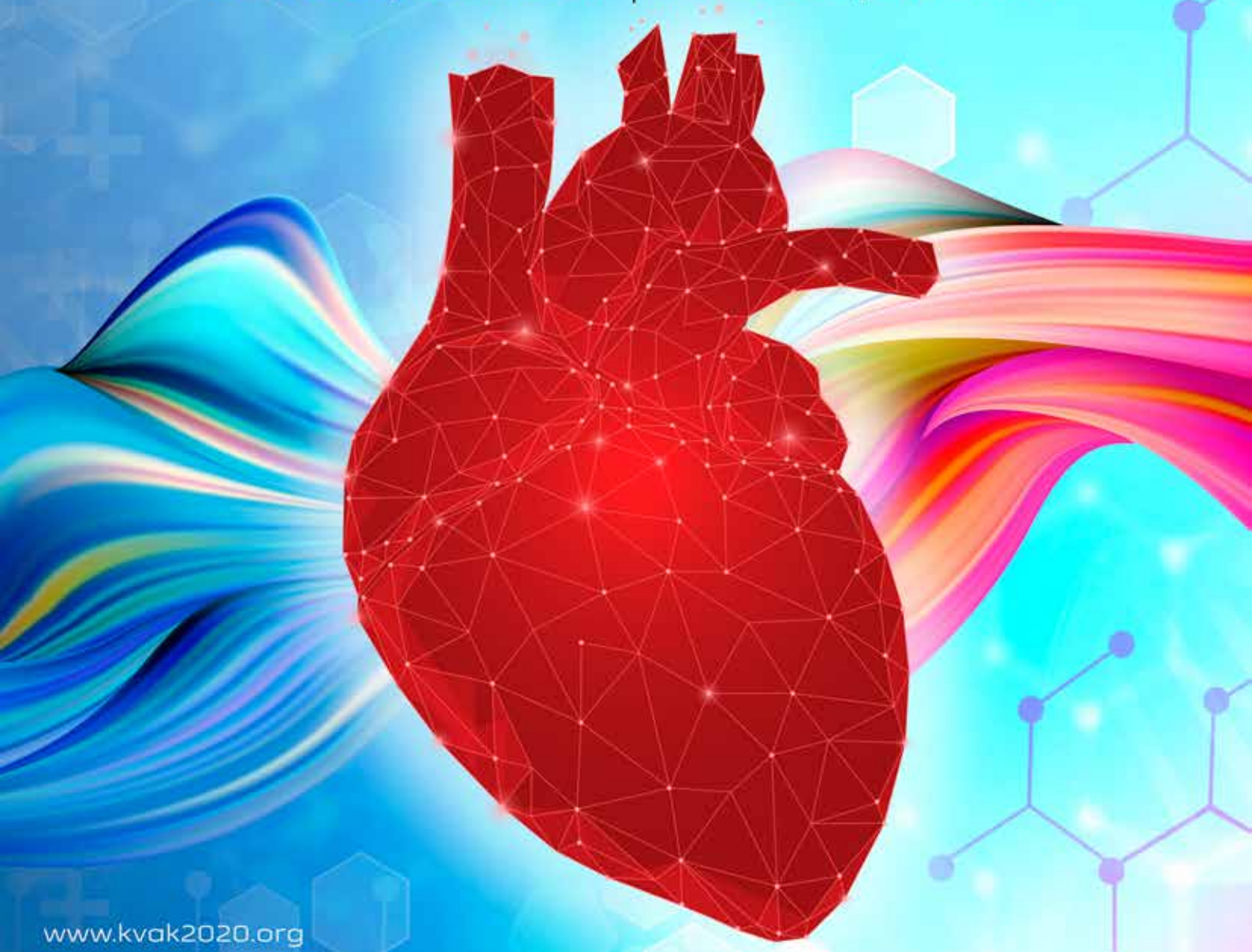
CARDIOVASCULAR ACADEMY CONGRESS

DIGITAL 2020

INTERNATIONAL YOUNG ACADEMY OF CARDIOLOGY E-CONGRESS 2020

18-20 September | 16-20 September



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POSTER PRESENTATIONS

PP-1: EVALUATION OF GALECTIN-3 IN PATIENTS WITH HEART FAILURE AND ITS RELATIONSHIP WITH NT-PROBNP LEVELS: A CASE-CONTROL STUDY

Yonca Yılmaz Ürün[1], Mahmut Özdemir[2]

[1]*Department of Gastroenterology, Bülent Ecevit Unıversity, Zonguldak, Turkey*

[2]*Kolan Hospital, Cardiology Department, İstanbul, Turkey*

Aim: Cardiac fibrosis, a pathological phenomenon in cardiac remodeling, is associated with heart diseases. The aim of this study was to investigate the relationship of Galectin-3 with N-terminal pro B-type natriuretic peptide (NT-pro-BNP) levels in patients with heart failure (HF).

Methods: A total of 50 patients with HF (patient group) and 30 subjects with normal ejection fractions (control group) were enrolled in this study. Serum galectin-3 levels and plasma NT-pro-BNP were measured in all subjects. Demographic and clinical characteristics of the patients were recorded. The Galectin-3 and NT-pro-BNP levels were compared between the groups.

Results: Patients with HF had significantly higher Galectin-3 and NT-pro-BNP levels than control subjects (37.5 (18.0-80.0) versus 12.00 (8.00-14.00), P<0.001; 467.0 (1157.5-5107.2) versus 50.0 (35.0-102.0), P<0.001, respectively). Galectin-3 was correlated with serum glucose, creatine, left atrial diameter, ejection fraction and NT-pro-BNP in the HF patients. There was a positive and significant correlation between the NT-pro-BNP and Galectin-3 levels (r=0.742, P=0.001). In addition, there was an inverse and significant correlation between the ejection fraction and Galectin-3 levels (r=-0.556, P=0.001).

Conclusion: The present study demonstrates that galectin-3 and NT-pro-BNP levels are significantly higher in patients with systolic HF. Galectin-3 was positively and significantly correlated with the NT-pro-BNP and inversely correlated with ejection fraction with HF. Our study also showed that Galactin-3 was strongly correlated with NT-pro-BNP levels.

Correlation between NT-pro-BNP and Galectin-3 levels

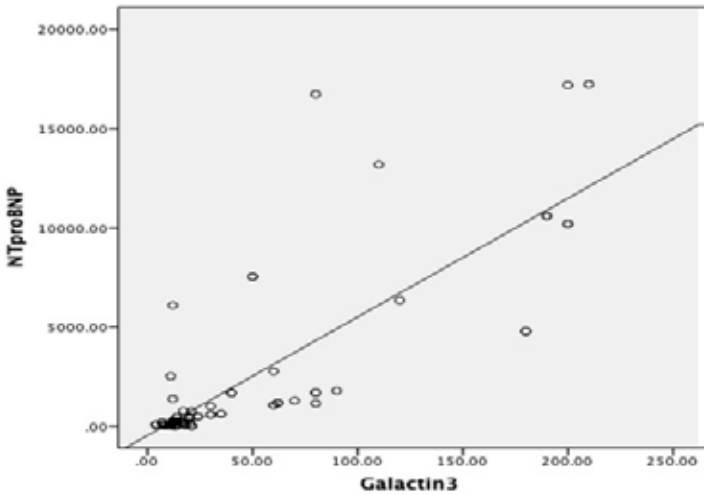


Table-1 Demographic and clinical characteristics of the study population.

	Control (n=30)	Heart Failure (n=50)	p
Age (years)	51.30±6.13	66.04±12.24	<0.01
Male %(n)	63(19)	46(23)	0.13
Hypertension %(n)	20(6)	36(18)	0.13
Diabetes mellitus %(n)	13(4)	30(15)	0.09
Hyperlipidemia %(n)	20(6)	44(22)	0.02
CAD %(n)	20(6)	100(50)	<0.01
Serum glucose (mg/dl)	139.07±2.39	139.08±2.32	0.98
Creatinine (mg/dl)	0.70 (0.60-0.83)	0.90 (0.80-1.00)	<0.01
Hemoglobin (g/dL)	13.63±1.96	12.62±2.16	0.03
LVEDD (cm)	4.80 (4.50-4.85)	5.05±0.54	0.04
LVESD (cm)	3.20 (3.10-3.42)	3.75±0.62	<0.01
LA (mm)	36.30±2.55	42.34±4.31	<0.01
Ejection Fraction (%)	58.10±3.74	37.70±5.58	<0.01
NT-pro-BNP (pg/ml)	50.00 (35.00-102.00)	467.00 (1157.50-5107.25)	<0.01
Galactine-3 (pg/ml)	12.00 (8.00-14.00)	37.50 (18.00-80.00)	<0.01

CAD, Coronary artery disease; LVEDD, Left ventricular end-diastolic diameter; LVESD, Left ventricular end-systolic diameter; LA, Left atrium.

PP-2: LOW SUPEROXIDE DISMUTASE AND CATALESE IS ASSOCIATED MALONDIALDEHYDE AND ISCHEMIA MODIFIED ALBUMIN IN PATIENTS WITH NON-ST ELEVATED MYOCARDIAL INFARCTION

Mahmut Özdemir

Kolan Hospital, Cardiology Department, İstanbul, Turkey

Background: Acute coronary syndrome is a manifestation of cardiac ischemia and results in myocardial injury and necrosis in line with the duration of ischemia. Excessive production of Reactive Oxygen Species (ROS) is proposed to mediate ischemia-reperfusion injury. This study aimed to assess the IMA (ischemia modified albumin), MDA (malondialdehyde), SOD (superoxide dismutase), and catalase in patients with non-ST elevated myocardial infarction (NSTEMI).

Materials-Method: The present study included 55 patients with NSTEMI and 55 healthy subjects prospectively. IMA, MDA, SOD, and catalase levels were measure from venous blood obtained from each patient within three h after the onset of symptoms. Angiography was performed within three days after the hospitalization. Significant coronary artery lesions were determined.

Results: IMA (3.14 ± 0.06 vs. 1.49 ± 0.03) and MDA (3.14 ± 0.06 vs. 1.49 ± 0.03) were higher, and SOD (1.10 ± 0.03 vs. 2.31 ± 0.02) and catalase (0.54 ± 0.02) vs. 0.22 ± 0.02) were lower in NSTEMI patients than control subjects. There was a significant correlation among IMA, MDA, SOD and catalase. Moreover, IMA values correlated positively with the multiple coronary lesions (r = -0.339 p = 0.011; r = 0.329 p = 0.014). There was no significant correlation among the MDA, SOD, catalase and affected coronary vessel numbers.

Conclusion: Our data reveal that levels of MDA and IMA were increased, and SOD and catalase levels were decreased significantly in patients with NSTEMI.

Table-1. The demographic and clinical data of the study population

	NSTEMI (n=55)	Control (n=55)	P
Age (years)	63.6±12.6	46.9±9.3	<0.001
Male/Female n	25.9±3.3	25.5±2.6	0.51
Hypertension n(%)	24(44)	15(27)	0.07
Troponin (ng/ml)	3.7(1.6-22.0)	0.016±0.005	<0.001
Hemoglobin (g/dL)	14.3±1.7 1	13.2±2.0	0.002
IMA(U/ml)	1.8±0.3	0.9±0.1	<0.001
MDA (µmol/L)	3.14±0.06	1.49±0.03	<0.001
SOD (U/ml)	3.14±0.06	2.31±0.02	<0.001
Catalase (U/ml)	0.22±0.02	0.54±0.02	<0.001

IMA (ischemia modified albumin), MDA (malondialdehyde), SOD (superoxide dismutase)

PP-3 THE RELATIONSHIP BETWEEN EPICARDIAL FAT TISSUE THICKNESS AND RED BLOOD CELL DISTRIBUTION WIDTH IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

Abdülmelik Yildiz[1], Cennet Yıldız[2], Ahmet Karakurt[3]
[1]*Nişantaşı University, İstanbul, Turkey*
[2]*Tekden Hospital, Kayseri, Turkey*
[3]*Kafkas University, Kars, Turkey*

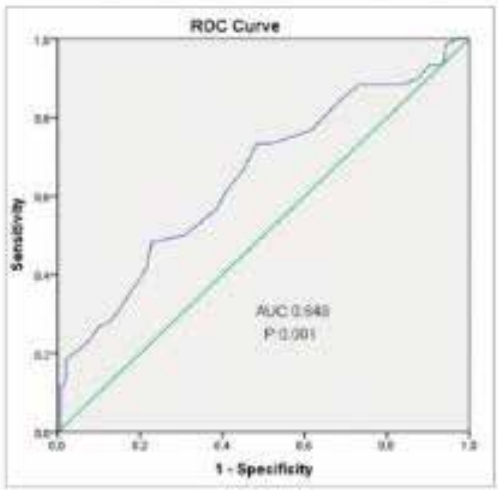
Aim: We aimed to investigate the possible differences in variables such as RDW and EFT thickness between diabetic and healthy patients and to assess the correlation between those parameters.

Materials-Methods: This single center prospective study which included 159 diabetic patients and 153 healthy controls. 2D and M mode echocardiographic examination was performed using standard apical, parasternal, and subcostal views in all the study participants.

Results: Clinical and biochemical parameters of the patiens are shown in Table 1. Diabetic patients had increased EFT thickness (4.3 ± 1.1 mm vs. 3.7 ± 1.0 mm P = 0.001), higher RDW values (13.5 ± 0.7 vs. 13.2 ± 0.7 P = 0.001), LDL C, TG, and HgA1c levels compared to their healthy counterparts. On correlation analysis, RDW and EFT (0.384, P < 0.001) were strongly positively correlated. RDW was also positively correlated with LDL C, TG, and HgA1c levels and negatively correlated with HDL C level. RDW value of 13.55 predicted EFT thickness >5 mm with a sensitivity of 61.7% and specificity of 58.8% (P: 0.001, Area under the curve [AUC]: 0.649, CI 95%: 0.564–0.733) [Figure 1]. HgA1C value of >7 predicted EFT thickness >=4.15 mm with a sensitivity of 60.7% and specificity of 60.4% (AUC: 0.651 vs. P < 0.001) [Figure 2]. According to the power analysis, the strength to EFT in predicting the diabetic patients (alpha value = 0.05 and 95% confidence) was 99.9%.

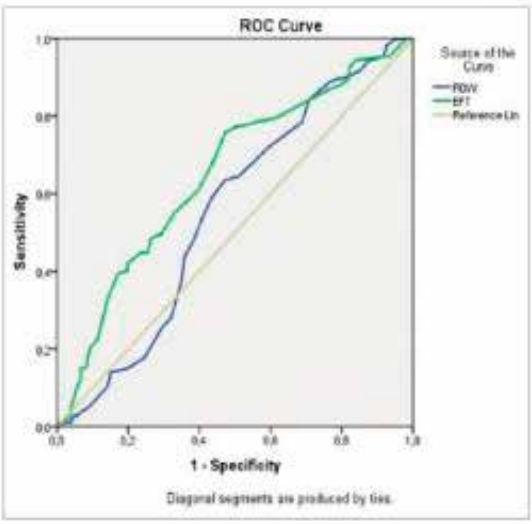
Conclusion: Our study showed that EFT thickness increased in diabetic patients, independent of age, gender, waist circumference, BMI, and it was correlated with RDW. EFT has been suggested to influence atherosclerotic lesion progression, plaque vulnerability, and destabilization. EFT thickness have been found to be in correlation with the fasting blood glucose levels. Diabetic patients have increased EFT thickness as compared to nondiabetic participants. It has a positive correlation with HbA1c levels EFT and CIMT values of the asymptomatic obese patients were shown to be decreased after significant weight loss. Diabetic patients also have higher RDW values when compared with normal participants. Chronic hyperglycemia occurring in DM has several effects on erythrocytes, including glycosylation of hemoglobin, impaired deformability, increased aggregation, and decreased circulatory half life. Nada et al. reported that RDW levels were significantly high in diabetic patients than in control subjects and it was positively correlated with HbA1c levels. DM is a metabolic disease which imposes substantial socioeconomic burden as a result of its complications. We showed that type II diabetic patients had higher EFT thickness and RDW levels when we compared them with the normal individuals. Moreover, EFT thickness was positively correlated with RDW. Measurement of EFT thickness and RDW in patients with DM may provide additional prognostic information.

FIGURE 1



Receiver-operating characteristic curve analysis of red blood cell distribution width value to predict epicardial fat tissue >= 5 mm

FIGURE 2



Receiver-operating characteristic curve analysis of red blood cell distribution width value to predict epicardial fat tissue >= 5 mm

Clinical and biochemical characteristics of patiens.

	DIABETIC GROUP (n=159)	CONTROL GROUP (n=153)	p
Age (years)	51.9±7.6	51.4±6.5	0.061
Female, n (%)	94 (62.6)	86 (56.2)	0.343
Male, n (%)	65 (37.4)	67 (43.8)	0.343
LVEF (%)	64.3±8.2	65.4±7.4	0.86
Smokers, n (%)	43 (28.6)	42 (27.7)	0.831
BMI (kg/m2)	28.5±1.3	28.4±1.2	0.062
SBP (mmHg)	130.3±10.3	126.3±11.4	0.08
DBP (mmHg)	77.0±7.7	73.5±8.1	0.018
TG (mg/dl)	149.7±13.1	139.9±13.2	<0.001
LDL-C (mg/dl)	143.5±14.8	128.2±16.0	<0.001
WBC count (109/µl)	8.1±1.1	7.8±1.0	0.065
RDW (%)	13.5±0.7	13.2±0.7	0.001
Hemoglobin (g/l)	13.2±0.7	13.4±0.7	0.081
Platelet count (109/µl)	260.3±50.3	258.5±53.4	0.764
FPG (mg/dl)	106.5±18.6	86.3±10.9	<0.001
HGA1c (%)	7.3±0.8	4.9±1.0	<0.001
C-reactive protein (mg/l)	2.6±2.1	2.2±1.8	0.09
Creatinine (mg/dl)	0.91±0.24	0.87±0.21	0.09
EFT (mm)	4.3±1.1	3.7±1.0	0.001

PP-4: FREQUENCY OF FRAGMENTED QRS IN SUBJECTS WITHOUT CARDIOVASCULAR DISEASE

Cennet Yildiz[1], Ahmet Karakurt[2], Abdülmelik Yildiz[3]
[1]*Tekden Hospital, Kayseri, Turkey*
[2]*Kafkas University, Kars, Turkey*
[3]*Ekotom Medical Center, İstanbul, Turkey*

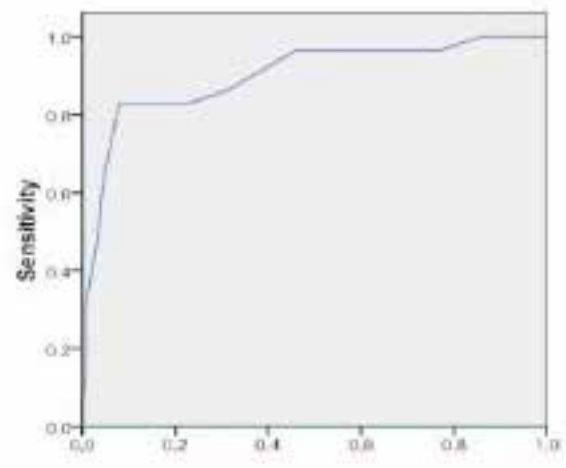
Aim: Fragmented QRS (fQRS) is a marker of depolarization abnormality due to in homogenous electrical activation of the infarcted ventricular myocardium. However, it is a nonspecific finding and can be present in persons without the cardiovascular disease. In this study, we aimed to investigate the prevalence and characteristics of the fQRS in subjects without cardiovascular disease.

Materials Methods: 417 patients were included in the study. All participants were evaluated with the history, physical examination and 12 lead electrocardiogram (ECG) along with 2-dimensional echocardiography. Criteria used in the diagnosis of fQSR include additional spikes within the QRS complex, the presence of additional R wave, notching in the S wave, the presence of R' more than two contiguous leads corresponding a major coronary artery on the resting 12-lead ECG.

Results: There was no statistically significant difference between two groups with respect to age, body mass index, smoking habits, cholesterol, LDL-C, HDL-C and triglyceride levels. Percentage of fQRS was statistically significantly higher in males compared to females (p=0.03). QRS duration and glucose level were significantly higher in patients with fQRS than those of the control subjects (p<0.001 for both comparisons) (Table 1). fQRS showed strong positive correlation with QRS duration and plasma glucose levels (r=0.437; p<0.001 and r=0.202 and p<0.001, respectively. (Figure1,2) On binary logistic regression analysis sex and glucose level were the factors found significantly associated with fQRS (OR=1.162, p=0.009 and OR=1.09, p=<0.001, respectively).

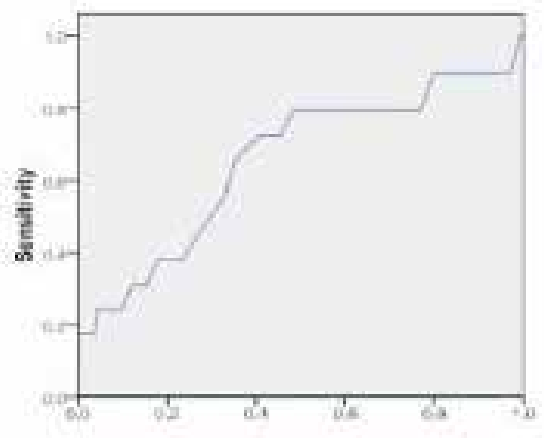
Conclusion: The fQRS is an electrocardiographic sign of delayed myocardial depolarization due to the myocardial ischemia, fibrosis, scar or inflammation. Garder et al, demonstrated that fQRS resulted from inhomogeneous and slow depolarization of the ventricles due to the myocardial scar in infarcted canine heart. Beyond its diagnostic value, it has prognostic value in patients with coronary artery disease, cardiomyopathy, Brugada syndrome, and hypertrophic cardiomyopathy. Although fQRS has been considered as a pathological finding for a long time, it is relatively common among healthy subjects as well. Tian et al., investigated the prevalence of fQRS in healthy persons. Of 1500 individuals who were screened on admission to hospital, findings showed that fQRS was present in 76 (5.1%) of subjects, 66/76 (86.8%) of which occurred in the inferior leads and 10/76 (13.2%) in anterior leads. Our numerical results range between the values of the studies mentioned above. Our study showed that 6.95% of the subjects without cardiovascular disease had fQRS. It was more common in males than females and older individuals. Subjects with fQRS had longer QRS durations and higher glucose levels compared to the subjects with normal QRS. Moreover, fQRS was positively correlated with male sex and fasting glucose levels.

FIGURE 1



ROC of QRS duration for predicting fQRS

FIGURE 2



ROC of Glucose level for predicting fQRS

Table 1

Parameters	Normal ECG (N:388)	fQRS (N:29)	p
Age, Mean±SD	39.9±10.9	42.9±8.12	0.018
Gender, n (%)			0.031
Female	197 (50.8)	9 (31)	
Male	191 (49.2)	20 (69)	
Smoking, n (%)			0.644
No	186 (47.9)	15 (51.7)	
Using	164 (42.3	10 (34.5	
Gave up	38 (9.8)	4 (13.8)	
BMI, Mean±SD	28±4.88	28.07±5.14	0.956
QRS Type, n (%)			
Anterior		7 (24.2)	
Inferior		22 (75.8)	
QRS Duration (ms)	82.6±4.15	90.5±4.28	<0.001
TKOL (mg/dl)	184.8±30.8	182.1±26.8	0.641
TG (mg/dl)	135.8±72.8	139.2±52.4	0.544
HDL-C (mg/dl)	46.3±11.2	43.3±10.58	0.172
LDL-C (mg/dl)	121±31.02	118.2±20.2	0.486
GLU (mg/dl)	96.5±9.23	104.5±16.9	0.006
RDW (%)	13.6±1.52	13.5±0.79	0.739
HGB (g/l)	14.05±1.6	14.5±0.72	0.367
MPV (fL)	9.13±1.69	9.46±1.67	0.301
NEU (K/uL	4.24±2.17	3.89±1.59	0.552
LYM (K/uL)	2.19±0.83	1.91±0.79	0.034
NLR	2.11±1.32	2.34±1.27	0.066
Creatinin(mg/dl)	1.01±0.14	1±0.16	0.423

Baseline and Biochemical parameters of groups.

PP-5: EVALUATION OF OMENTIN LEVELS IN PATIENTS WITH UNSTABLE ANGINA PECTORIS, NON-ST ELEVATED MYOCARDIAL INFARCTION (NSTEMI) AND STEMI

Tayyar Akbulut[1], Mahmut Özdemir[2]

[1]*Van Training andResearchHospital, CardiologyDepartment, Van, Turkey*

[2]*Bayrampasa Kolan Hospital, Cardiology Department, İstanbul, Turkey*

Background: Acute coronary syndrome (ACS) is an ischemic cardiac disease that could result in myocardial necrosis with the prolonged duration of ischemia.Omentin (intelectin-1) is a new biomarker that is released from adipose tissue. Omentin is associated with coronary artery disease (CAD), and it has an acute ischemic injury-reducing effect.This study aimed to assess the omentin levels in patients with unstable angina pectoris (USAP), Non-ST segment elevation myocardial infarction (NSTEMI), and ST-segment elevated myocardial infarction (STEMI).

Materials-Method: The present study included 59 patients with ACS and 22 healthy subjects prospectively.MB fraction of creatine kinase (CKMB), troponin, myoglobin, and omentin levels was measure from venous blood obtained from each patient within six h after the onset of symptoms.Plasma omentin levels were determined with an omentin enzyme-linked immunosorbent assay kit.

Results: Omentin levels were similar in ACS patients and control subjects (6.0 ± 1.7 vs. 6.3 ± 1.3; p = 0.40).There was no significant correlation among CKMB, troponin, myoglobin, and omentin levels.Moreover, omentin levels were similar in ACS subgroups (p = 0.58). There was no significant correlation between the body mass index and omentin levels (r = -0.186 p= 0.09).

Conclusion: In conclusion, our data reveal that levels of omentin were similar in patients with ACS and control subjects. There was no significant correlation among CKMB, troponin, myoglobin, and omentin levels.

Table-1. The demographic and clinical data of the study population

	Control (n=22)	Patients (n=59)	p
Age (years)	31.2±13.1	59.9±12.2	<0.001
Male/Female, n	14/8	41/18	0.60
BMI (kg/m2)	24.2±2.2	27.7±3.4	<0.001
Total cholesterol (mg/dl)	135.9±25.2	183.8±36.6	<0.001
Hemoglobin (g/dL)	13.9±0.9	12.8±1.7	0.007
Omentin (ng/ml)	6.3±1.3	6.0±1.7	0.40
Troponin (ng/ml)	-	5.7±8.0	-
CKMB (ng/ml)	-	83.0(9.0-234.0)	-
Myoglobin (ng/mL)	-	268.0(91-656)	-

BMI, Body mass index; CKMB, Creatine kinase-MB.

PP-6: TRYING TO PULL BACK IS NOT ALWAYS NECESSARY: AN INTERESTING STENT DISLODGEMENT CASE

Gökhan Çetinkal, Betül Balaban Koçaş
Sisli Hamidiye Etfal Training and Research Hospital, Department of Cardiology, İstanbul, Turkey

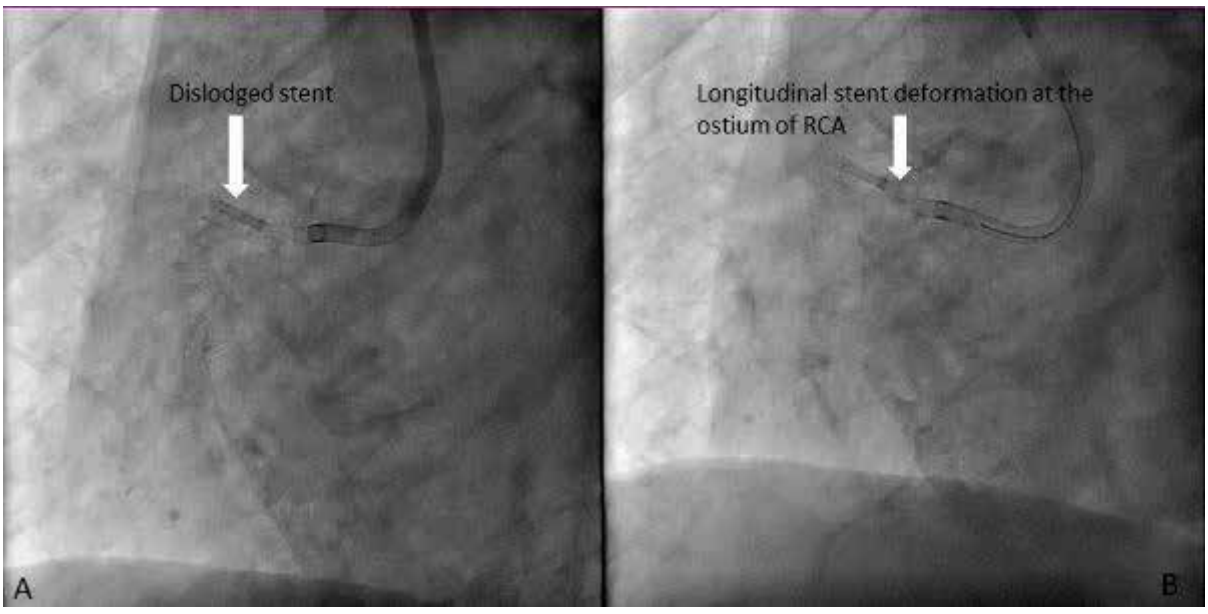
Introduction: Stent dislodgement in the coronary arteries is a rare but potentially fatal complication of PCI. Although it does not commonly happen in the modern PCI era;especially with the usage of new generation DES, severe coronary angulations, coronary tortuosity, diffuse long lesions, and calcified coronary arteries may lead this undesired event.When it happens, retrieval of a dislodged stent can be performed either surgically or percutaneously using different retrieval techniques. Here, we report a complicated case of heavily calcified lesion in the proximal RCA, which led coronary artery stent dislodgement during primary PCI.

Case: 75 year old female patient was admitted to ER with a new onset typical angina. ECG revealed ST elevation in inferior derivations.We planned to perform emergency coronary angiography and primary PCI. Critical stenosis at the ostium and mid segment of RCA was detected. We deployed to the proximal and mid segment of RCA. Because of severe calcification we could not sufficiently advance the stent till the distal part of mid lesion. We had to intubate the patient suffering from severe pulmonary edema at that time. We tried to cross the proximal angulation with a support of Guideliner catheter but we could not succeed. So we tried to take the stent into the guiding catheter but it was jammed to the distal struts of the first stent. Control images showed that the last stent was dislodged from its balloon and stucked to the distal part of the proximal stent. We hardly passed the dislodged stent through its center and tried to pull it back with a small balloon. So, we advanced a balloon but unfortunately all system was ejected again. But after several attemps, we failed to take it. Because of the prolonged procedure time as a result of unsuccessful attempts, distal TIMI-3 flow achievement, complete regression of ST elevation and patient's need for surgery due to complex coronary anatomy, we concluded the procedure.12 hours after the procedure we extubated the patient successfully. One week later, CABG operation was performed. Because of severe calcification, surgeons could not retrive the stent. Patient was discharged from the hospital two weeks later uneventfully.

Discussion: Actually we could prefer to conclude the case because CABG operation might be the preferred method for complete revascularisation as a consequence of the patient's complex coronary anatomy and other comorbidities such as DM. Even though operators tend to retrive or crush the dislodged stent automatically, conservative management may be the best option in the presence of distal TIMI-3 coronary flow and the stabilized condition

Conclusion: Despite stent entrapment seems like a nightmare especially during primary PCI, operators must keep calm and should not insist on removing it from the coronary artery as it may lead to fatal complications.

Stent dislodgement



PP-7: TO DETERMINE THE CO-RELATION BETWEEN 1ST SET OF TROPONIN I, AGE, DURATION OF CHEST PAIN AND LVEF IN PATIENTS PRESENTING WITH FIRST STEMI

Kaleem Ullah Sheikh[1], Abeer Sarfaraz[1], Sana Sarfaraz[2], Tanveer Bano[3]

[1]*Liaquat National Hospital, Karachi, Pakistan*

[2]*University Of Karachi, Karachi, Pakistan*

[3]*Jinnah University For Women, Karachi, Pakistan*

Objective: To Assess the relationship between 1st set of Trop I with age of patient, duration of chest pain and LVEF in patients presenting with first STEMI.

Basically to evaluate the contribution of increasing age with increased duration of chest pain and 1st set of trop I and decrease in LVEF in first stemi

Methodology: It was a cross sectional prospective observational study which was conducted at a tertiary care hospital, at the Cardiology department for a period of 12 months. All patients regardless of gender, aged between 30-80 years with co-morbidities including hypertension and diabetes mellitus were included presenting with acute STEMI but all patients with any previous history of cardiac surgery, any contraindication to reperfusion therapy and other co-morbidities including renal failure and sepsis etc. were excluded.

Result: A total of 150 patients were included in this study with a mean age of 61.2 ± 10.3 years out of which males were (71 %), diabetics (51%), hypertensive (59%), smokers (49%). Around 61% of the people presented to emergency > 12 hours after onset of chest pain, 13% between 6 to 12 hours and 26% in less than 6 hours after onset. For statistical analysis SPSS 21 was applied and significant relationship was observed between age and duration of symptoms, age and Troponin I and Trop I and left ventricular ejection fraction (p value <0.05).

Conclusion: It was seen in our population that people older than 50 years tend to present to emergency department late with chest pain symptoms which results in a linear rising relationship with Troponin I and with increasing Troponin I there was significant reduction seen in LVEF.The key message is to create awareness amongst people older than 50 years about the importance of chest pain and how it should be approached early in order to decrease coronary disease morbidity and improve outcomes.

Patient History and Demographics

Patients characteristics	MEAN ± S.D
Age (years)	59.4 ±10.7
Patients characteristics	Percentage (%)
Male	71
Age	
20-40 years	4
40-50 years	23
> 50 years	73
Co-morbidities	
Diabetics	45
Smokers	52
Hypertensives	59
Duration of chest pain	
< 6 hours	18
6-12 hours	22
>12 hours	60
Ejection Fraction	
< 30%	10
30-50%	60
> 50%	30

The table shows that the mean ages of the patients enrolled were 59.4. Majority of the patients were male (71%) as compared to females. In terms of age demarcation 4% lied in the range of 20-40 years, 23% of the population lied in the range of 40-50 years and 73% were greater than 50 years. 45% of the population were diabetics, 59% population was hypertensive where as 52% of the population smoked. The data also showed that 60% of the patients reported at emergency department when their chest pain duration exceeded 12 hours. The ejection fraction of 60% population was in the range of 30-50 according to the data.

PP-9: THE RELATIONSHIP BETWEEN INFLAMMATION MARKERS AND THE CIRCADIAN RHYTHM OF BLOOD PRESSURE IN NORMOTENSIVES

Seyda Gunay[1], Serhat Calıskan[2], Deniz Sıgırlı[3]

[1]Uludag University Departement of Cardiology, Bursa, Turkey

[2]Istanbul Bahcelievler State Hospital, İstanbul Turkey

[3]Uludag University Departement of Biostatistics, Bursa, Turkey

Objective: In most healthy individuals, blood pressure shows a circadian rhythm. Being nondipper in normotensive individuals as well as hypertensives increases the cardiovascular risk. In this study, the relationship between inflammation markers and nondipper pattern in normotensive individuals was investigated.

Method: Patients with office blood pressure measurements <140/90 mmHg but suspected of hypertension in differential diagnosis and because of that followed up with ambulatory blood pressure monitoring (ABPM) at our outpatient clinic were retrospectively screened. Based on ABPM results, hypertensive patients were excluded. Remained normotensive individuals were included in the study and divided into 2 groups as dippers and non-dippers according to decline in nighttime systolic blood pressure. Monocyte / high density lipoprotein ratio (MHR), platelet/ lymphocyte ratio (PLR) and neutrophil / lymphocyte ratio (NLR) as inflammation markers were derived from biochemical laboratory tests and complete blood count findings. Then, these markers were evaluated with respect to dipping status.

Results: A total of 131 patients (mean age: 49.2 ± 15.1 years, 76% females) were included in the study. Among these, 55 (42%) patients were grouped as dippers, 76 (58%) patients were grouped as non dippers. None of MHR (p=0.929), NLR (p=0.152) and PLR (p= 0.110) significantly differed between the groups

Conclusion: MHR, PLR and NLR were not predictors of non dipping in normotensive individuals

Table-1: Inflammation markers derived from laboratory tests

	Dipper (n=55)	Non-Dipper (n=76)	p-value
MHR	1,18 (0.25-4.23)	1,21 (0.41-3.50)	0.929
PLR	0,96 (0.52-2.06)	1,09 (0.47-2.28)	0.110
NLR	1,68 (0.63-3.85)	1,89 (0.61-3.79)	0.152

Data presented as median (minimum-maximum) values MHR: Monocyte / High density lipoprotein Ratio. PLR: Platelet/ Lymphocyte Ratio. NLR: Neutrophil / Lymphocyte Ratio.

PP-10 NEUTROPHIL TO HIGH-DENSITY LIPOPROTEIN RATIO HAS A PROGNOSTIC VALUE IN HEART FAILURE PATIENTS TREATED WITH IMPLANTABLE CARDIOVERTER DEFIBRILLATOR TO PREDICT LONG TERM MORTALITY

Serkan Asil

Gülhane Training and Research Hospital Department of Cardiology Ankara, Turkey

Introduction: Neutrophil to high-density lipoprotein ratio (NHR) is a new inflammation marker with proven prognostic values in myocardial infarction. However, a clinical study demonstrating the prognostic value of NHR in heart failure patients treated with an implantable cardioverter-defibrillator (ICD) is not yet available. In this study, it is aimed to demonstrate the relationship between NHR and mortality development in patients with heart failure with ICD.

Material-Method: 194 patients who underwent ICD implantation due to systolic heart failure between January 2015 and December 2019 have been included in this study. Information relating to the biochemical and hematological parameters and death status of the patients has been obtained through the hospital information system.

Results: The mean age of the patients was 59.84±13.26. The female gender ratio was 25.3%. Death developed in 16 patients (8%) after a median follow-up of 27 months. While basal urea, uric acid, GGT, CRP and neutrophil levels have been found to be high and hemoglobin and lymphocyte levels have been found to be low in the death developed group. While the rates of NHR have been statistically significantly higher in the group with death during follow-up (p:0.035). In ROC analyses, mortality has been predicted with 86% sensitivity and 62% specificity (p:0.035 AUC:0.74 CI:0,53-0,95) of values 0,16 of NHR and above.

Conclusion: In our study, it has been shown that NHR ratios, which is an inflammation markers, can predict mortality in patients with ICD implanted heart failure.. This is the first study demonstrating the predictive power of NHR in this patient group.

PP-11: EFFECTS OF RADIOFREQUENCY CATHETER ABLATION ON LIFE QUALITY INDEX IN PATIENTS WITH PREMATURE VENTRICULAR COMPLEX-INDUCED CARDIOMYOPATHY

Erhan Yilmaz[1], Huseyin Altug Cakmak[2], Fahriye Vatansever[1], Selcuk Kanat[1], Ahmet Tutuncu[1], Fahri Er[1], Mehmet Demir[1]

[1]*Department of Cardiology, Health Science University, Bursa High Education Training and Research Hospital, Bursa, Turkey*

[2]*Department of Cardiology, Mustafakemalpasa State Hospital, Bursa, Turkey*

Objective: Premature ventricular complexes (PVCs) are commonly seen arrhythmia in worldwide. They may lead to left ventricular dysfunction and dilated cardiomyopathy even if not underlying structural heart disease. Radiofrequency catheter ablation (RFCA) has been reported as safe and effective treatment to decrease or eliminate PVC burden and restore left ventricular function in previous studies. Minnesota Living with Heart Failure Questionnaire (MLHFQ) is one of the most commonly used and validated questionnaire for evaluating heart failure specific quality of life. A decreased quality of life of patients were reported as the MLHFQ scores were increased in recent studies.

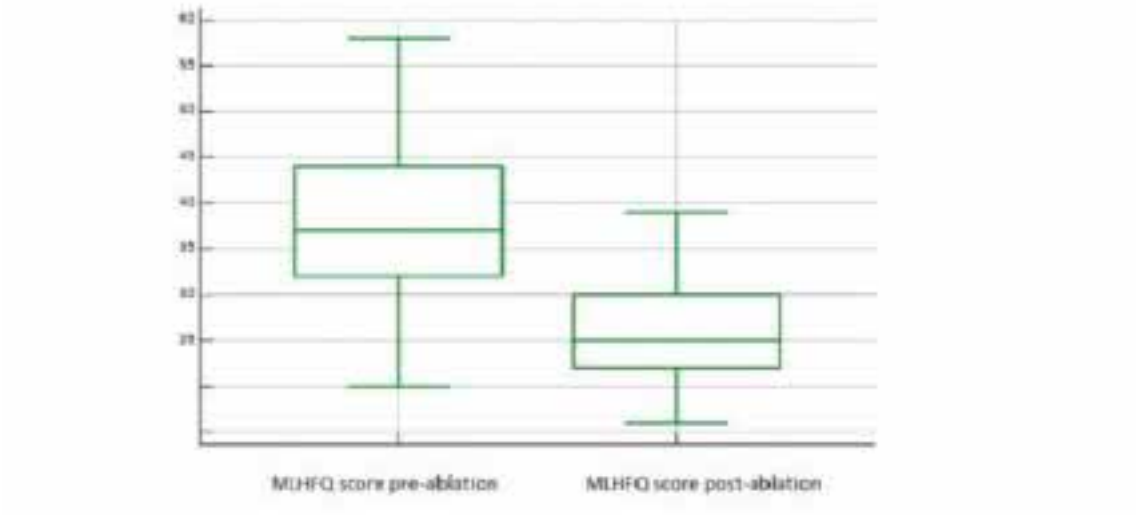
Since an effect of RFCA on quality of life of the patients detected by MLHFQ scores in PVC-induced cardiomyopathy remains unknown, we aimed to investigate this impact. Moreover, an association of N-terminal probrain natriuretic peptide (NT-proBNP) with MLHFQ scores was investigated in this setting.

Method: Sixty consecutive patients without structural heart disease, who underwent RFCA because of frequent (PVC burden > 10000 beats/day) and symptomatic PVCs refractory to medical treatment between January 2017-2019, were prospectively enrolled in this study. NT-proBNP levels were measured at admission by using an enzyme-linked immunosorbent assay method. Baseline and post-ablation functional status and capacity of the patients were determined with MLHFQ scores, New York Heart Association (NYHA) class and six minutes walk test. Study patients were followed-up for 6 months after the RFCA. Post-ablation levels of the NT-proBNP, NYHA class and MLHFQ scores were measured and change of values were compared with baseline.

Results: MLHFQ scores were found to be markedly reduced in the post-ablation period as compared to the pre-ablation (38.10 ± 9.04 vs. 25.95 ± 5.36, $p < 0.001$)(Figure). NT-proBNP levels significantly decreased in sixth month after RFCA (118.50 vs. 95 pg/mL, $p< 0.001$). NYHA classes of the study patients importantly decreased from two to one ($p < 0.001$). Furthermore, six-minute walk distances significantly increased from 259.50 ± 65.68 to 312 ± 57.31 meters ($p < 0.001$) in sixth month of ablation procedure. The MLHFQ difference scores were calculated based on both pre and post-ablation sixth month scores. MLHFQ difference scores were demonstrated to be significantly negatively correlated with the pre-ablation NT-proBNP ($r = - 0.27$, $p = 0.041$). However, there was no relation between MLHFQ difference score and rates of change of the proBNP in follow-up period ($p=0.386$).

Conclusion: We demonstrated a reduction in the MLHFQ score in post-ablation follow-up period, which infers an improvement in quality of life of the patients with cardiomyopathies in terms of both physically and emotionally. Moreover, recovery of the MLHFQ score and functional capacity after PVCs ablation may indicate a beneficial effect of RFCA to quality of life of the patients with heart failure.

Figure



Comparison of the baseline and post-ablation MLHFQ scores in patients with PVC induced cardiomyopathy.

PP-12: BRUGADA-LIKE ECG PATTERN DEVELOPING AFTER CHEST PAIN IN A PATIENT HOSPITALIZED WITH COVID-19

Murat Çap, Erkan Baysal

Department of Cardiology, SBU Diyarbakır Gazi Yaşargil Education and Research Hospital, Diyarbakır, Turkey

İntroduction: Coronavirus disease 2019 (COVID-19), which was first reported in Wuhan, China, and spread rapidly within a few months and declared as a pandemic by WHO, is a disease caused by the Severe acute respiratory syndrome coronavirus 2 (SARS-Cov2). Although it often causes pneumonia, it can affect the heart. This viral infection can trigger or reveal certain cardiovascular pathologies such as coronary syndromes, myocarditis, arrhythmias. Here, we will present a patient who developed a Brugada-like electrocardiogram (ECG) pattern after chest pain during hospitalization with COVID-19.

Case presentation: A 40-year-old male patient admitted to our hospital with fever and cough was hospitalized with the diagnosis of Coronavirus disease (COVID-19). RBBB was observed on admission ECG (Figure 1). On the 4th day morning, the type 2 Brugada pattern was observed on the ECG (Figure 2A). At the same day, the patient had chest pain and we observed the type 1 Brugada pattern on the ECG and the fever was 37,5 (Figure 2B). Echocardiography was normal. Serial troponins measurements were normal. The Brugada-like pattern was regressed in the following days (Figure 2C). There was no history of syncope, tachycardia, and no sudden cardiac death in his family. Since the patient was at low risk for major cardiac adverse events, he was discharged by recommending cardiology follow-up.

Discussion: Brugada syndrome is a inherite syndrome that can be associated with sudden cardiac death. ECG shows ST elevation in the right precordial leads. Fever, alcohol, metabolic disorders, myocarditis, drugs can cause the formation of a Brugada-like ECG pattern. In a recently published case, a COVİD-19 patient presenting with syncope was found to have Brugada syndrome. A transient Brugada-like ECG pattern was observed in another COVID-19 patient with normal coronary arteries who underwent angiography due to chest pain and low ejection fraction. Acute coronary syndromes, myocarditis, and arrhythmias have all been described in the setting of COVID-19 infection. Considering these effects of COVID-19, just like fever, metabolic disorders, drugs, it may cause both formation of a Brugada-like pattern on ECG and the appearance of Brugada syndrome.

Figure 1

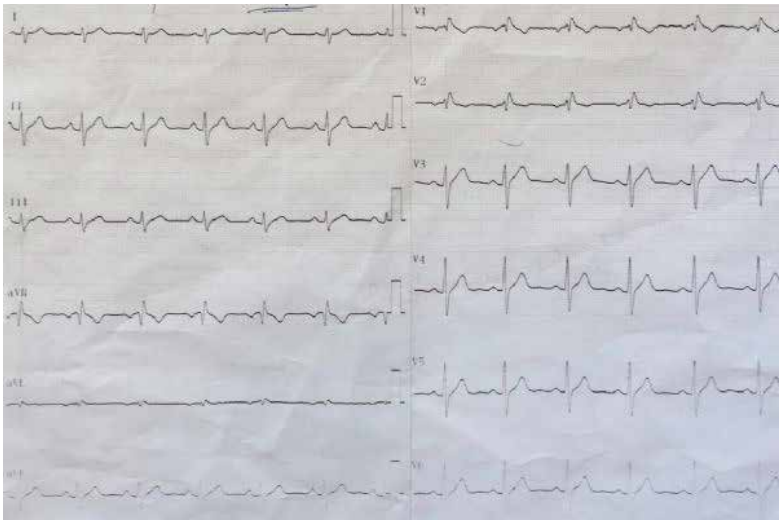


Figure 1. The patient's initial ECG in the emergency department.

Figure 2

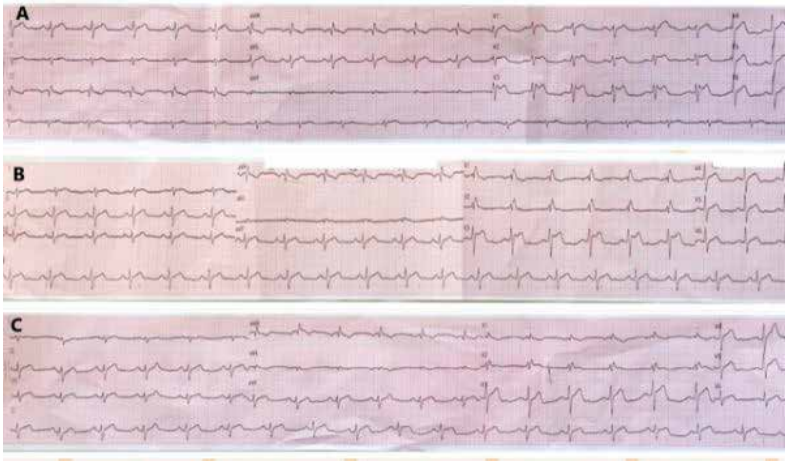


Figure 2A. The ECG showed type 2 Brugada pattern Figure 2B. The type 1 Brugada pattern in the ECG during chest pain Figure 2C.The last ECG before discharge

PP-13: CHEMOTHERAPY DELIVERING PORT-A-CATH MIGRATION INTO THE HEART: A CASE REPORT

Abdalraouf Mohammed Omar[1], Osama Bheleel[1], Afaf Abushaala[2], Laila Sabei[3], Amadallah Rakha[1]

[1]Cardiology Department, Tripoli University Hospital, Tripoli, Libya

[2]Oncology and Hemathology Department, Tripoli University Hospital, Tripoli, Libya

[3]Community and Family Medicen Department, University Of Tripoli

Introduction: Chronically diseased patients who require long-term therapy through central venous access, a totally implanted central venous port systems are used. Such beneficial devises have life-threthinig complications.

Method and Result: We report a 45-year-old Libyan female diagnosed with poorly differentiated gastric adenocarcinoma, underwent total gastrictomy with eso-jujenal anastomosis with port-a-cath placement to deliver chemotherapy. At the fourth cycle of chemotherapy, unfavourable event occurred; the catheter dislodged and migrated to the right cardiac chambers, which was successful removed by local anaesthesia with loop-snare technique via the right femoral vein and the patient preference to complement the chemotherapy cycles through peripheral line.

Conclusion: port-a-cath is beneficial devise has serious complications. Avoiding chemotherapy extravasation a bedside echocardiography should be done to evaluat the catheter. Further studies are needed in evolution of the port-a-cath by transthorasic echocardiography.

PP-14: ACUTE MYOCARDITIS: EPIDEMIOLOGICAL, CLINICAL AND IMAGING CHARACTERISTICS

Emna Allouche[1], Oumayma Zidi[1], Hana Mrassi[2], Habib Ben Ahmed[1], Hakim Ben Jemaa[1], Mohamed Béji[1], Feten Boudiche[1], Wejdène Ouechtati[1], Leila Bezdah[1]

[1]Cardiology department, Hôpital Charles Nicolle de Tunis Tunisia

[2]Faculté de Médecine de Tunis, Université Tunis El Manar, Tunis, Tunisia

Introduction: Acute Myocarditis (AM), defined as an inflammation of the myocardium, results, most often, from common viral agents. The diagnosis is challenging for the physician because of its clinical polymorphism. Cardiac magnetic resonance imaging (MRI) may provide an alternative method for the diagnosis without the risk of biopsy. In this study, we aimed to describe epidemiological, clinical, biological and imaging outcomes of patients with AM.

Methods: This was a descriptive, retrospective study, including 28 patients hospitalized for acute myocarditis in the cardiology department of Charles Nicolle hospital between 2010 and 2020. All patients had an electrocardiogram, troponin bioassay, cardiac echography and cardiac MRI.

Results: The sex ratio M / F was 4.6. The mean age was 32.6 ± 13.5 in men and 45.8 ± 15 in women (p = 0.05). Smoking was noted in 43% of cases (n = 12). The other cardiovascular risk factors were (%, n): hypertension (7.2), diabetes (7.2) and dyslipidemia (18.5). Chest pain noted in 93% of cases (n = 26). Influenza-like illness was reported in 39% of cases. Physical examination was normal in 93% of pts (n = 26). A fever was noted in 18% of the cases (n = 5). The ECG showed (%, n): a sinus rhythm (89, 25), a right bundle branch block (25,7), an ST segment depression (14, 4), an ST segment elevation (36, 10) and negative T waves (29, 8). The chest X-ray was normal in 64% of the cases (n = 18). Cardiac enzymes were elevated in 79% of cases (n = 22) and a biological inflammatory syndrome was present in 43% of cases (n = 12). US found an overall myocardial function conserved in 89% of cases (n = 25) with disturbances in segmental kinetics in 14% of cases (n = 4). Coronary angiography was normal in 100% of the cases.

MRI confirmed the diagnosis of acute myocarditis in all patients. It showed delayed enhancement interesting the sub-epidcardium layer, respecting the endocardium and non-corresponding to a vascular distribution.

Conclusion: AM is a potentially life-threatening disease that primarily affects a young male population. Cardiac MRI has become the primary tool for non-invasive assessment of myocardial inflammation in patients with suspected myocarditis. It confirms the diagnosis and excludes coronary artery disease.

PP-15: A GIANT CARDIAC LIPOMA DIAGNOSED BY NON-INVASIVE IMAGING

Büşra Mavi, Nihan Turhan Çağlar
Department of Cardiology, Bakırköy Dr Sadi Konuk Training and Research Hospital, İstanbul

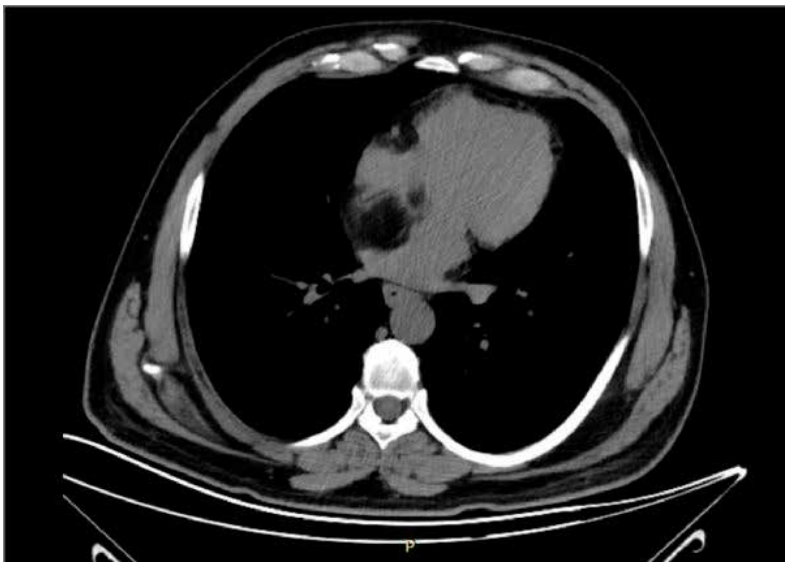
Objective: Cardiac lipomas are rare benign tumors of the heart. They are usually asymptomatic. Herein we describe a case of a cardiac lipoma.

METHOD (CASE): A 54 years old man who has chronic obstuctive pulmonary disease, hypertension, and obstructive sleep apnea went for a routine check-up. Thorax CT revealed a mass in the right atrium which was concordant with lipoma. Hence, he was consulted to cardiology department. Transesophageal echocardiography demonstrated a hyperecogenic, homogeneous, immobile 35x38 mm mass with well-defined borders on the right atrial side of the interatrial septum. The mass was not related to other intracardiac structures, nor the tricuspid valve was damaged. There was not increased FDG uptake on low density lesion area on positron emission tomography. As the patient was asymptomatic medical treatment, instead of surgery was planned after heart team evaluation. Antiaggregant therapy was started.

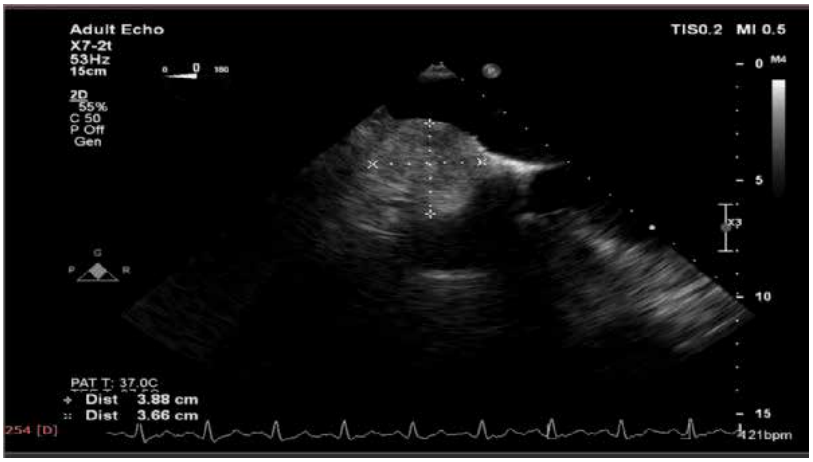
Results: The patient continues his routine controls without symptoms. The characteristics and diameters of the mass are steady on follow-up.

Conclusion: Cardiac lipomas are well-characterized on cardiac CT, although the diagnostic modality of choice is cardiac magnetic resonance imaging. Due to its easy availability and noninvasive nature, transthoracic echocardiography is the most common initial diagnostic tool to define the presence, extent, and location of cardiac tumours. Cardiac CT can help identify the presence of fat and so can be used to correctly diagnose cardiac lipoma. PET-CT can also help to determine nature of the mass. Surgery is the treatment in symptomatic patients, however treatment in asymptomatic patients is controversial.

CT



transeusophagial echocardiography



PP-16: WORSENING DYSPNEA IN A 32-YEAR-OLD WOMAN: SCIMITAR SYNDROME

Yavuzer Koza[1], Ferhat Kanbay[1], Hakan Taş[1], Fatih Alper[2]
[1]*Atatürk University Faculty of Medicine, Department of Cardiology, Erzurum, Turkey*
[2]*Atatürk University Faculty of Medicine, Department of Radiology, Erzurum, Turkey*

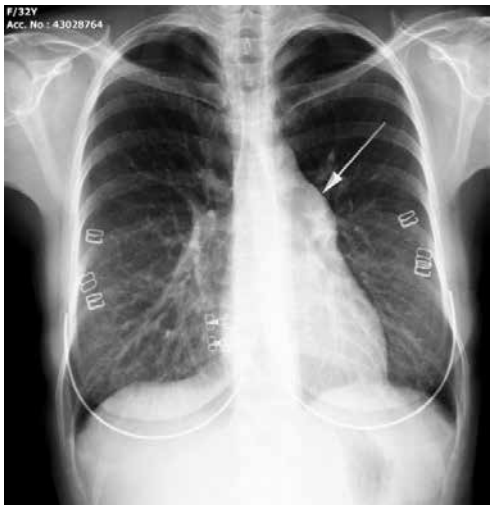
Objective: Scimitar syndrome (SS) is a rare congenital anomaly of pulmonary venous return in which an anomalous right pulmonary vein drains into the inferior vena cava. Females are more frequently affected than males. Although it is usually an incidental finding on chest radiograph, adult patients with SS can present with respiratory symptoms.

Case: A 26-year-old woman presented with dyspnea and fatigue for two weeks. Her past medical history was unremarkable and she had no constitutional symptoms. Physical examination was normal. Electrocardiography showed normal sinus rhythm. A chest radiogram revealed a prominent pulmonary conus (Figure 1). Transthoracic echocardiography revealed an estimated systolic pulmonary artery pressure of 38 mm/hg with a mild right heart chamber dilatation. On auscultation there was a loud P2 with a soft holosystolic murmur in the tricuspid area and a long diastolic murmur in the pulmonary area.

Results: Serial Computed tomography images in sagittal (Fig. 2a) and coronal planes (Fig.2b) revealed a common venous channel (with the joining of the right superior and inferior pulmonary veins), which was seen to course infero-medially to drain into the terminal part of inferior vena cava. A right heart catheterization for further assessment was recommended but she refused.

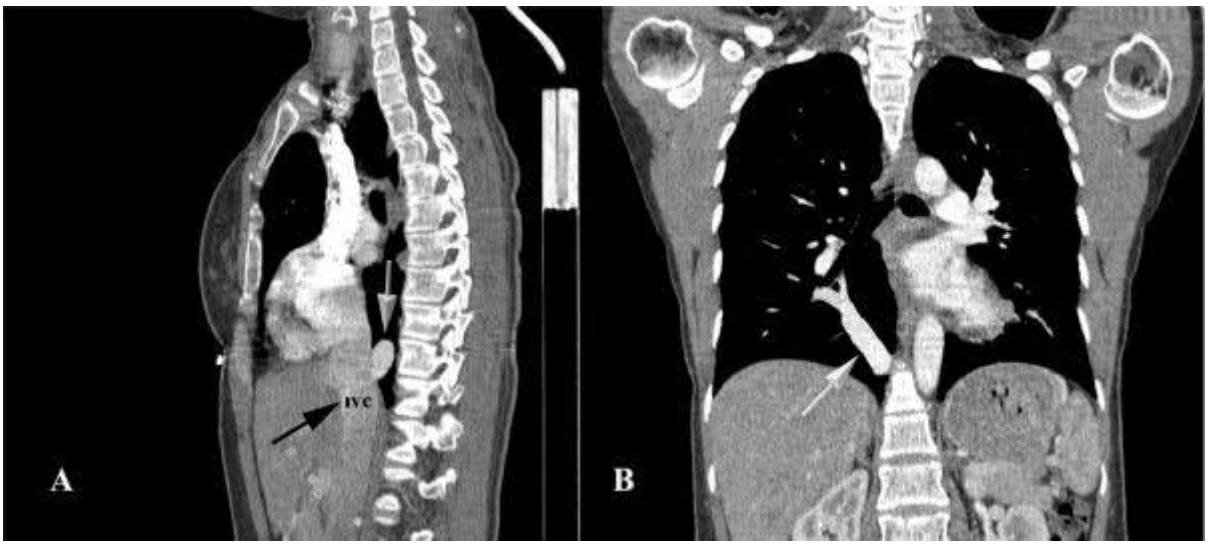
Conclusion: As in the present case, SS can be present with mild pulmonary hypertension due to a significant left-to-right shunt. The majority of the cases are associated with a partial or total hypoplastic right lung but this feauture was not present in our case. In contrast to common understanding that adult SS typically has a benign course, the patients should be regularly followed for the probability of pulmonary hypertension occurrence.

Figure 1



Chest radiography showing prominent pulmonary conus (arrow)

Figure 2A/B



A-Sagittal CT image showing the inferior vena cava (IVC, black arrow) and Scimitar vein (grey arrow) B- Coronal CT image showing the Scimitar vein (grey arrow)

PP-17 SUPERIOR VENAE CAVAE OBSTRUCTION AND INTRACARDIAC THROMBUS DUE TO PERMANENT DIALYSIS CATHETER

Ahmet Cagdas Yumurtas[1], Duygu Inan[2], Ozan Tezen[1], Nursen Keles[1]

[1]Dr. Siyami Ersek Thoracic and Cardiovascular Surgery Training and Resarch Hospital, İstanbul

[2]Başakşehir Çam ve Sakura Country Hospital, İstanbul

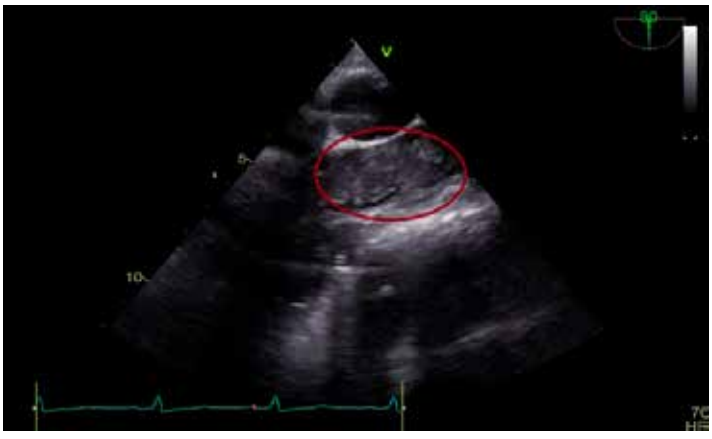
Although guidelines suggest leaving permanent dialysis catheter as a last resort nowadays it is commonly used. Even though catheter related thrombus cases are rare, they can be highly complicated. In this paper we will discuss a case which is thought firstly to be infective endocarditis however during medical process found out to be catheter thrombus.

63 years old woman, who has hypertension, diabetes mellitus, renal failure for which she is having dialysis three days a week, and does not have any known coronary artery disease. She was admitted to ER department with shortness of breath. She was having exertional dyspnea. Her electrocardiogram did not show any abnormalities. In her physical examination, S1 and S2 were normal, S3 could be heard. She had mild pre-tibial edema. Her body temperature was 36,4 °C. In her blood tests she had 8000 WBC, 9.3 mg/dl of HGB, 0,2mg/dl of hs-CRP, 7,5 mg/dl creatinine and negative for troponin levels. She was admitted to cardiology department for further evaluation because in her transthoracic echocardiography(TTE) showed right atrial mass. Although her symptoms were not in line with infective endocarditis, blood culture samples were sent. First transesophageal echocardiography(TOE) imaging showed masses of 25x16 mm in the inferior venae cavae(IVC) opening which reaches to right atrium, and 8x14 mm in the superior venae cavae(SVC) opening and 20x10mm in the right atrium appendix(RAA) which are primarily looked like thrombus and vegetations. Blood cultures were clean and patient's shortness of breath continued. Then pulmonary CT angiography was performed. It showed subacute embolism of mid and distal segments of both pulmonary arteries. Second TOE was performed. It showed masses of 20x12 mm reaching RA from IVC, 21x14 mm completely obstructing SVC, 25x37mm in RA. Pre-operative tests was performed. Intra-operative thrombi originating from permanent dialysis catheter was observed. Thrombi in the RA and RAA were removed. 19 days after the first surgical operation arteriovenous fistula operation was performed. 7 days after the second operation the patient was discharged. TTE which is performed 4 months later did not show any thrombus and the patient did not had any shortness of breath.

Although catheter thrombosis cases are rare, complications of them could be serious. In medical literature general practise is anti-coagulant therapy however there are hardly any evidence of it correcting catheter functions. Surgical treatment is avoided because of high mortality and morbidity rates. In cases like ours, which thrombus is vast and reaching to pulmonary arteries, surgical treatment is inevitable. Removal of permanent dialysis catheter and fistula opening is an logical strategy. In our case, even though SVC was completely obstructed, there was not any SVC syndrome symptoms and despite thrombus reaching to IVC and pulmonary arteries our patient's clinical condition was relatively well.

Image of thrombi in operation

Image of thrombi in TOE



PP-18 CHALLENGE CASE COMBINATION OF AORTIC STENOSIS AND HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY

Ahmet Anıl Başkurt, Hatice Ozdamar, Onercan Çakmak, Ebru Ozpelit, Oktay Ergene
Cardiology Department of Dokuz Eylul University; Izmir; Turkey

Primary hypertrophic cardiomyopathy (HCM) coexisting with AS is known but uncommon. There are guidelines to suggest management strategies for severe AS or obstructive HCM, but the combination of the two in one case poses special problems. We presented this case which combination of AS and subvalvular obstruction creates diagnostic and therapeutic challenges.

CASE PRESENTATION: An 92-year-old woman with presumed aortic stenosis was referred to our medical center for TAVI. She has no medical history and complained of worsening shortness of breath, particularly on exertion. Echocardiogram revealed asymmetric septal hypertrophy with systolic anterior motion of the mitral valve; peak gradient of LVOT was 90 mm Hg with Valsalva (Figure 1-A). She also had a severely calcified aortic valve with restricted leaflet opening, maximum transvalvular velocity of 4.5 m/sec, maximum instantaneous gradient of 80 mmHg across the valve, and mean gradient of 39; AVA of 0.68 cm²; mild aortic regurgitation, mild tricuspid regurgitation, and modarete mitral regurgitation; normal pulmonary artery systolic pressure (Figure 1-B-C-D).

DISCUSSION: If a patient has only HCM, surgical septal myectomy is recommended in patients with severe dyspnea or chest pain despite optimal medical therapy. If a patient has only aortic stenosis, SAVR or TAVI is recommended. However, in our case it was critical to relieve the subvalvular obstruction because an acute decrease in the after-load could unmask or incerase dynamic subvalvular obstruction. Thus, SAVR needs to be coupled with septal myectomy to prevent intraoperative or postoperative mortality and morbidity. Cardiogenic shock and prolonged hospitalization have also been reported following TAVR when the subvalvular obstruction was not fixed. If only TAVR is performed without relieving the subaortic obstruction, that would also carry unacceptable risk. Only one case has been reported where TAVR was performed to relieve both valvular and subvalvular obstruction. An approach that could be considered in our patient is relief of the subaortic obstruction by alcohol ablation of the hypertrophied septum before fixed the aortic valvular stenosis. Benefits and risks of such a sequence are unknown at this point. The complex issues involved in this case were discussed with the patient and her family, and they opted for continued medical treatment.

Figure 1

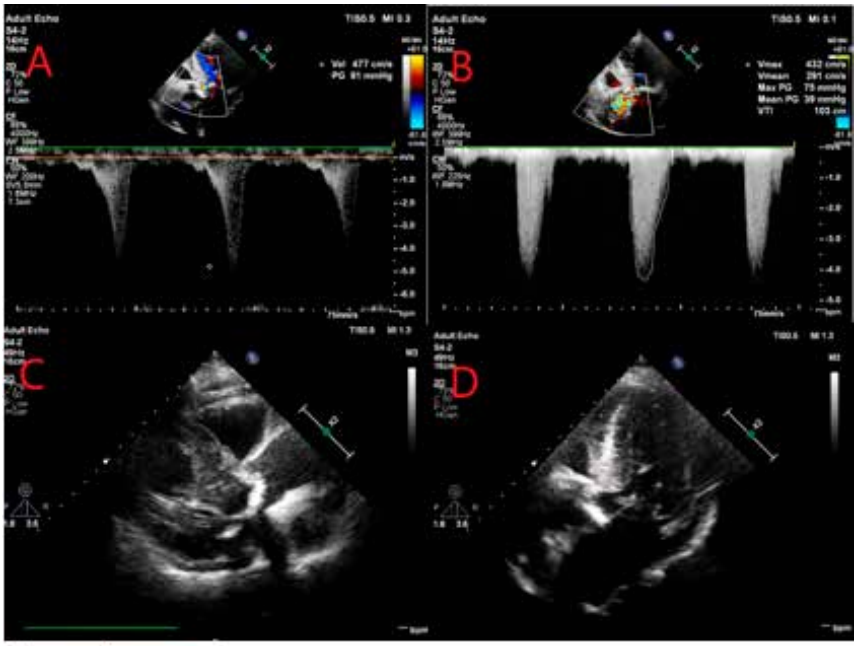


Figure 1:
A:LVOT GRADIENT B: TRANSAORTIC GRADIENT
C:PARASTERNAL LONG AXIS VIEW D:APICAL 5 CHAMBER VIEW

PP-19: THE RELATIONSHIP OF HEART FAILURE WITH GLOBAL WALL HYPOKINESIA IN INTENSIVE CARE UNIT IN CAMBODIA 2017-2018

Youhok Lim, Nara Leng, Saly Saint
Faculty of Medicine, University of Puthisastra, Phnom Penh, Cambodia

Background: The Ministry of Health (MOH) of Cambodia reported an increasing number of inpatient cases with cardiovascular diseases (CVDs) in 2018, and heart failure (52.8%) was the most common etiology of CVDs. HF may be associated with a wide spectrum of LV functional abnormalities, which may range from patients with normal LV size and preserved ejection fraction (EF) to those with severe dilatation and/or markedly reduced EF.

Methods: A retrospective study was conducted in patients aged >= 18 years who were diagnosed with HF and admitted to the Intensive Care Unit of Preah Ket Mealea Hospital in Phnom Penh from 1st January 2017 to 31st December 2018. Out of 140 cases, 20 were excluded because they did not meet the inclusion criteria. Study variables were categorized as subgroups of HF as per AHA/ACC guidelines. The clinical diagnosis of HF subtypes and two-dimensional echocardiography were analyzed.

Results: HFrEF was present in 15%, HFpEF borderline in 13.3%, HFpEF in 71.7% of selected 120 patients with HF. Left ventricular regional wall motion (LVWM) among subtypes of HF shows in Figure 1. Global wall hypokinesia (19.2%) was the most common. Global wall hypokinesia was more prevalent in HFrEF vs HFpEF borderline vs HFpEF (10.8% vs 5.8% vs 2.5%, P <0.001). The RR of HFrEF or HFpEF borderline and global wall hypokinesia was 2.44 (95% CI, 0.90-6.62).

Conclusions: Most of patients with HFrEF had global wall hypokinesia more than seen in HFpEF borderline or HFpEF. Global wall hypokinesia is significantly associated with HFrEF or HFpEF borderline.

Proportion of Patients with Heart Failure subtypes and Left Ventricular Wall Motion by Echocardiogram

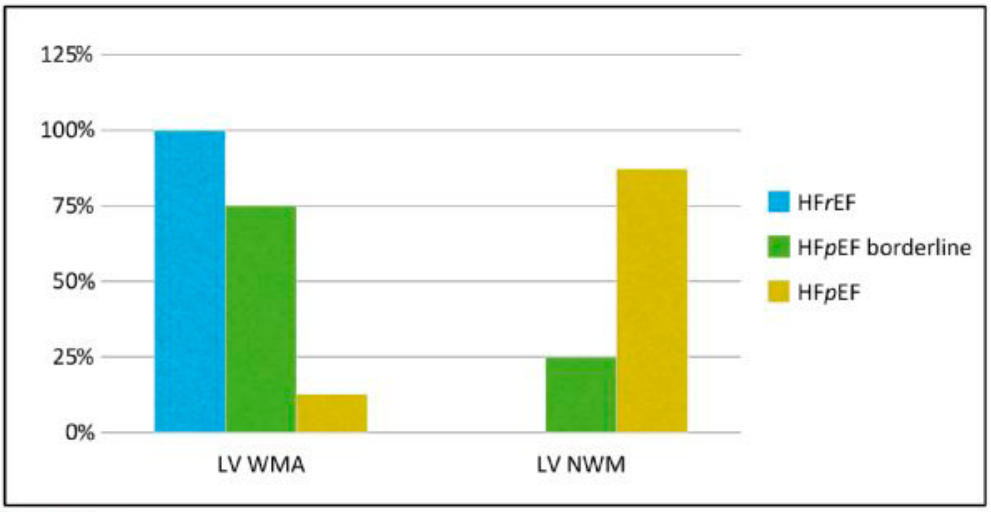


FIGURE 1. Proportion of Patients with Heart Failure subtypes and Left Ventricular Wall Motion by Echocardiogram. HFrEF, heart failure with reduced ejection fraction; HFpEF, heart failure with preserved ejection fraction; LV, left ventricular; WMA, wall motion abnormalities; NWM, normal wall motion.

Left Ventricular Wall Motion Abnormalities (LV WMA) were more frequent in HFrEF and then in HFpEF borderline.

PP-20: ASSOCIATION OF LEFT ATRIAL VOLUME INDEX WITH N-TERMINAL PRO-B-TYPE NATRIURETIC PEPTIDE LEVEL IN HEART FAILURE PATIENTS WITH PRESERVED EJECTION FRACTION

Md. Shamim Chowdhury[1], Shiblee Sadeque Shakil[2], Rakhal Chandra Debnath[2], Mirza Md Nazrul Islam[2], Mrs. Noor E Jabeen[3], Md. Saidur Rahman[2], Kantish Kumar Sarker[2], Gobinda Kanti Paul[2]

[1]National Heart Foundation Hospital & Research Institute, Mirpur Dhaka, Bangladesh

[2]Mymensingh Medical College Hospital, Mymensingh, Bangladesh

[3]United hospital Limited, Gulshan,Dhaka, Bangladesh

Background: Heart failure is a major public health issue with a current prevalence of over 23 million worldwide. Epidemiologic studies suggest that nearly one-half of patients with heart failure have a normal ejection fraction that is now termed HFpEF. Most pathophysiologic abnormalities in patients with HFpEF are related to diastolic function. LA volume has been termed "Glycosylated hemoglobin of Diastolic dysfunction". Natriuretitic peptides are widely accepted biomarker in HFrEF patients. Now a days, it is also considered for HFpEF patients for diagnosis & prognosis purpose.

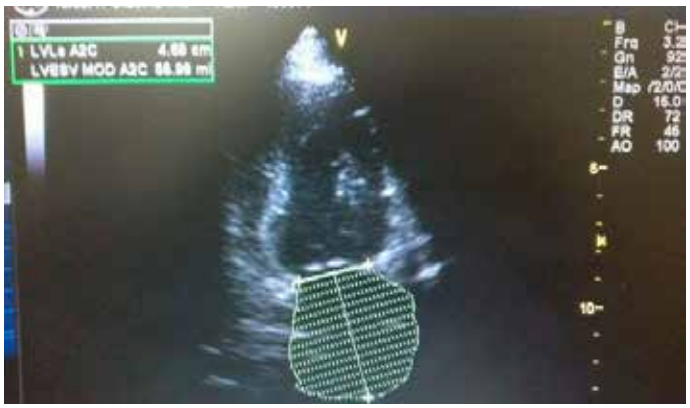
Objectives: To find out the association of Left atrial Volume index (LAVI) with N-terminal Pro B-type Natriuretic Peptide level in HFpEF patients.

Methods: This Cross Sectional Analytical Study was conducted in the department of Cardiology, Mymensingh Medical college Hospital, Mymensingh from October 2016 to September 2017. Total 120 HFpEF patients were included after considering inclusion and exclusion criteria. Sample population were divided into two groups, Group –I: HFpEF patients with LAVI <=34ml/m2 (n=77); Group –II: HFpEF patients with LAVI >34ml/m2 (n=43).

Results: In this study mean NT-pro BNP value of group-I and group-II were 284.45(±24) pg/ml and 1673.99 (±119.90) pg/ml respectively. It was statistically significant (p value < 0.05). Among the Demographic & clinical parameters Age, BMI, Hypertension, Diabetes mellitus, NYHA class were found statistically significant. Among the echocardiographic parameters, LV hypertrophy, Mitral inflow E/A ratio, TDI derived mitral annular e' septal velocity, E/ e' (septal) ratio were statistically significant. Statistically significant moderately positive correlation was observed between NT-proBNP level and LAVI value, correlation coefficient (r = 0.553, p=0.001).

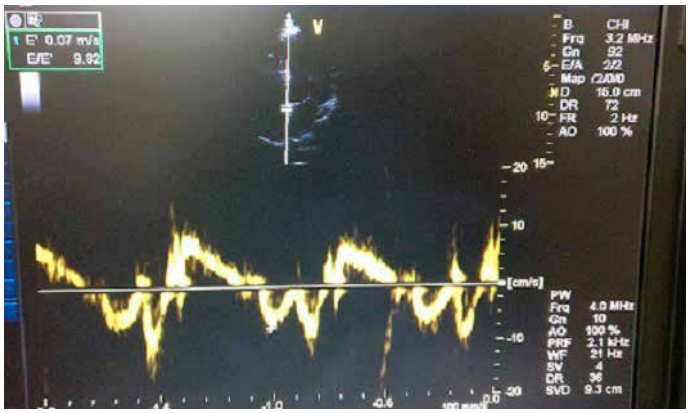
Conclusion: Elevated LAVI is associated with elevated NT-proBNP level in HFpEF patients & LAVI can be used as a marker of HFpEF.

La Volume 2 chamber view



La volume measurement in 2 chamber view

Tissue doppler imaging



Tissue Doppler E/e'

NT-Pro BNP level of the study population (n=120)

Parameter	Group I (n=77) Mean ± SEM	Group II (n=43) Mean ± SEM	P value
NT pro BNP level (pg/ml)	284.44±24	1673.99±119.90	0.001**

mean NT pro BNP level among the two groups Group –I: HFpEF patients with LAVI <=34ml/m2 (n=77); Group –II: HFpEF patients with LAVI >34ml/m2 (n=43).